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ABSTRACT

The computer-based reading and study skills curriculum which is described was developed to meet the need for a more efficient and effective means of increasing the reading and study skills of Navy recruits. The parameters specified by the Navy led to the development of a curriculum composed of a modified version of an existing reading curriculum (Control Data Corporation's Basic Skills Learning System) and a project-developed study skills component. Supplementary Navy-specific, job-related reading materials were also developed and included. The resulting curriculum, called PREST, was tested at the Recruit Training Command in Orlando, Florida, with a 2-part evaluation: (1) a prepilot test involving 2 military instructors and 14 recruits; and (2) a pilot test with the same 2 instructors and 76 recruits. Data were also gathered on comparison groups. No significant differences were found in achievement or affective measures, but PREST required fewer instructors, and those instructors did not need to be trained reading teachers. Specific findings with implications for computer assisted instruction developers are noted, and detailed study data are displayed in four tables. (LMM)

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USING CBI TO DEVELOP JOB-RELATED READING AND STUDY SKILLS: THE PREST CURRICULUM FOR NAVY RECRUITS

by

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USING CBI TO DEVELOP JOB-RELATED READING AND STUDY SKILLS: THE PREST CURRICULUM FOR NAVY RECRUITS

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ABSTRACT

In an attempt to meet the Navy's need for a more efficient and effective means of increasing the reading and study skills of Navy recruits, Research for Better Schools, Inc. of Philadelphia was contracted to develop and demonstrate a computer-based reading and study skills curriculum for Navy recruits. The specific parameters of the project, as specified by the Navy, led to the development of a curriculum composed of a modified version of an existing reading curriculum and a project-developed study skills component to meet the specific learning requirements of Navy recruit training. Supplementary Navy-specific job-related reading materials were also developed/included.

The resulting curriculum, called PREST, was tested at the Recruit Training Command in Orlando. No significant differences were found in achievement or affective measures, but PREST required fewer instructors and those instructors did not need to be trained reading teachers. Specific findings of interest to CAI developers were revealed through process evaluation.

Background and Purpose

In today's post-draft era, more and more recruits are entering the military services without the reading and study skills needed to complete their basic training, let alone perform adequately in later military assignments; and all indications are that even more individuals entering the service will require some kind of remedial reading instruction. At the same time, instructor costs are going up. Therefore, the traditional classroom-type remedial academic program currently used by the Navy may not be adequate to support future needs.

The PREST project specifically addressed the Navy's need to develop an efficient and effective means of increasing the reading and study skills of Navy recruits with minimal loss of training time and minimal diversion of military personnel. To address this need, a computer-based reading and study skills curriculum was developed for Navy recruits who enter the service with less than a sixth-grade reading level and for recruits who demonstrate academic difficulty during recruit training.

Parameters

The Navy specified a number of parameters within which the PREST curriculum was to be developed. (1) The curriculum had to be comprehensive, since it must provide for all the reading and study skills instruction which would be required to develop the skills recruits need to manage the reading, lecture notetaking, study, and academic test-taking tasks which are part of Navy recruit training. (2) It had to provide reading instruction from the 4.0 to 6.0 reading grade level (RGL), since it had to be capable of raising reading

skills of recruits from fourth or fifth grade to at least a sixth-grade level. (3) It had to be designed for adults, since all recruits are at least 18 years of age. (4) It had to be efficient, since each day in remedial training requires one more day of delay in the preparation for actual military service. (5) It had to be computer-based, since the Navy wanted to explore the possible use of computer technology to reduce the total number of personnel and the extent of their preparation required to facilitate remedial instruction. (6) It had to be specifically designed to prepare recruits for basic training rather than being a general academic program. (7) It had to be Navy job-related in order to provide skills and information which are needed for performance of entry-level Navy jobs. (8) It had to be designed for a student-instructor ratio of 24 to 1, in order to provide a personnel saving in comparison to the 8 to 1 ratio in the Navy's current, classroom-type remedial reading and study skills curriculum. (9) It had to be ready for testing in nine months. And (10) it had to be developed and tested for under $220,000.00

Procedures

Given the time and cost constraints in conjunction with all the other parameters, the only apparently feasible course of action was to identify an existing, proven-effective, and efficient computer-based reading program for adults and to modify and augment it to meet the Navy's specific recruit-training needs.

Only one computer-based adult reading program was identified as appropriate to meet the Navy's recruit reading instruction needs. This was the reading component of Control Data Corporation's Basic Skills Learning System (BSLS). This program was comprehensive, consisting of instructional modules on 111 specific reading objectives covering five areas (strands) of reading instruction (word analysis, vocabulary development, literal comprehension, interpretive comprehension, and evaluation comprehension) designed for use with individuals reading as low as 3.0 RGL, with an exit mastery level of 8.0 RGL; designed for adults, and tested and proven effective with young adult populations in high schools, training centers, correctional institutions, and the military; efficient, in that instruction was based on individual diagnosis and prescription, therefore, only needed instruction is presented; and computer-based, operating on CDC's PLATO instructional system.

Furthermore, the BSLS reading curriculum was amenable to the specific modifications and augmentation required by the Navy's other parameters. It could be modified from a general academic program to meet only recruit reading needs through elimination of specific objectives which were not germane. Augmentation of the curriculum to include study skill instruction required the bulk of the project's developmental effort.

One complete additional strand was added to provide Navy recruit-training study skill instruction. To make the content of these materials Navy-related, all examples in the introductory lesson and throughout the study skill strand were based on information taught during recruit training. This served not only to give the recruits a headstart on basic training information when they returned to training, but it also helped to integrate the remedial program with the rest of recruit training, thereby making the recruits feel that they were already involved in their Navy training rather than being set back into yet another remedial high-school type curriculum like those in which they had obviously failed in the past.

In addition, supplementary off-line drill and practice materials for additional practice in reading comprehension skill objectives, instructor training, and a management system for use by one instructor per 24 recruits using 12 terminals were also developed.

Staff were able to develop the study skills curriculum, and become sufficiently familiar with the functioning of the PLATO system to develop introductory and study skills on-line materials compatible with this system and to modify the BSLS reading component to meet Navy requirements within the nine-month development period and within budgetary constraints.

Evaluation

A two-part evaluation was carried out at the Recruit Training Center in Orlando, Florida. Formative evaluation, a prepilot involving two military instructors and 14 recruits, took place in January and February 1980. A third-party summative evaluation, a pilot with the same two instructors and 76 recruits, began in February and lasted until early May 1980. Data on a comparison group was gathered from October 1979 to January 1980 (three civilian and two military instructors and 55 recruits) and June and July 1980 (the same three civilian and two military instructors, one new, and 20 recruits).

The comparison group was established to compare relative efficacy, efficiency, and cost effectiveness of the two approaches. Efficacy was measured by pre and post-testing on a Navy-related reading test and by scores on academic tests taken when the

recruits returned to basic training. Efficiency was measured in terms of the number of days required to complete each of the programs. Cost-effectiveness was measured by comparison of the projected yearly costs of the experimental curriculum with the costs of the existing, classroom-type curriculum. No significant differences were found in the two approaches in terms of either of the above-mentioned measures of efficacy or efficiency; however, the PREST curriculum did provide a significant increase in the instructor-student ratio (1:24 cf. 1:8), and it did allow the Navy to use military instructors who were not trained as reading instructors whereas the tradition curriculum required the use of civilian reading teachers. (Civilian teachers subcontracted from an outside agency, as is currently the practice in Orlando, are often bound by contractual agreements which give them guaranteed holidays and shorter and inflexible daily working hours which prevent the Navy from offering instruction at the times and under the conditions which is considers most beneficial.) On the other hand, a PLATO-based experimental curriculum was more costly and would probably continue to be so until the mid or late 80's when hardware costs are expected to be sufficently reduced.

Findings

A small-group process evaluation was carried out during both the prepilot and pilot studies. On site observations were conducted throughout the prepilot. On-line process data, e.g., activities engaged and time per activity, was available via the PLATO system for all on-line activities for individuals and for the groups as a whole. Hardcopy was made of this data for later evaluation. The following findings are based primarily on the prepilot data. Although the prepilot sample was smaller (N=14) than the pilot (N=76), the prepilot is more extensive and it also includes recruits with a RGL less than 4.0, recruits referred for past academic failures, and recruits of less than average intelligence, types which were not included in the pilot study.

- The curriculum was usable with recruits entering with a RGL as low as 3.0. (See Table 1, Entering RGL, time on line, and academic test results.) This substantiates CDC's claim that the BSLS is functional with RGLs 3.0 to 8.0.
- Those entering the curriculum with lower RGLs progressed very slowly in the first reading strands, but, as they gained primary reading skills, their progress came closer to that of those entering at higher RGLs. (See Table 1.) This is particularly evident with recruit J, who ultimately completed recruit training at the normal pace, i.e., he did not have to retake any academic tests.
- The curriculum was usable with Mental Category IV recruits (those with less than average intelligence), but those individuals required more time to complete the curriculum and often experienced academic difficulties later in recruit training. (See Table 1, Recruits A and K.) Actually, during the pilot, Category IVs progressed more quickly and did better in academic performance than the two in the prepilot, who clearly enjoyed being in PREST and showed little eagerness to leave, i.e., rejoin the regular recruit program; therefore, they may have been atypical subjects.
- Recruits spent more time per lesson on basic word analysis, literal comprehension, and study skills than on vocabulary development or higher level comprehension activities. (See Table 1, Hours on Line/Strands.) This pattern suggests that the recruits lacked basic reading skills but their language and cognitive skills were generally intact. The disproportionate amount of time spent on study skills is probably accounted for by the facts that the skills taught were new and the instructional item content was written at 9.0 to 13.0 RGL in order to mirror actual recruit reading requirements.
- Formal instruction in sound/symbol relations was not necessary when using PREST. The reading component of PREST contains no such instruction. A staff developer on site during the prepilot had intended to add such materials to the curriculum as the need arose; however, during the six weeks of the prepilot, not even those recruits with the lowest RGLs required this assistance.
- The PREST curriculum was operable with military instructors who were given a brief orientation to the curriculum and instructional principles but who had no prior training in the teaching of reading. This conclusion is based upon the training and success of the two instructors involved in the PREST evaluation.
- PREST was operable using a management system of one instructor per 24 recruits using 12 PLATO terminals. PREST instructors stated they felt that one instructor could handle 30 recruits using 12 terminals, but this hypothesis was not tested.

- Recruits were able to work at the PLATO terminal for six hours per day without suffering from fatigue or loss of motivation. Recruits working on off-line materials often appeared listless and tired; whereas recruits working on-line almost always displayed concentration and interest.
- Some recruits completed the PREST curriculum even though they no longer wanted to stay in the Navy. Of five recruits who took part in the prepilot but left the Navy before completion of PREST, two went AWOL the day before they were to return to regular recruit training.
- The more access recruits had to the PLATO terminals, the faster their progress. The recruits in the prepilot completed PREST in less time (median = 10 days) than recruits in the pilot (12.5 days) even though their RGLs were lower (3.0 to 5.8 compared to 4.0 to 6.8). This is most probably attributable to the fact that prepilot recruits took part in PREST at a time when there were less than 12 recruits enrolled at all times; hence prepilot recruits spent a greater portion of their time working on-line.
- Age, number of grades completed, number of days attended, and initial RGL are not good predictors of success in recruit training. (See distribution of these factors in Table 2, Recruits who failed no recruit academic tests, and Table 3, Recruits who failed 2 or more academic tests.)
- The Gates-MacGinitie reading test, as currently administered in Navy recruit screening, is not a highly reliable measure. (See Table 4, Changes in Gates-MacGinitie Scores.)

Conclusions/Recommendations

A number of conclusions can be drawn from the above. Of greatest interest to developers of CBI may be the suggestions that students can work at computer terminals for up to six hours per day; that time on line, at least for drill and practice, is more important to progress than off-line work; and that CBI could be used to hold potential dropouts in school.

Of specific interest to persons involved in the reading and study skill instruction of young adults are the curricular findings which suggest that greatest emphasis should be placed on word analysis, literal comprehension, and study skills; that formal instruction in sound-symbol relations may be "nice to know" rather than "need to know" for persons reading above 3.0 RGL; and that CBI may be an effective and highly motivational method of teaching young adults in groups of up to 24, using instructors with minimal training.

A follow-up study with a similar population in the private sector based on the above findings and conclusions seems to be indicated.

(Tables 1-4 are provided on the following pages.)

Table 1. Entering RGL, time on line, and academic test results (Prepilot)

Recruit	RGL (based on Gates-MacGinitie test and retest)	Hours on Line							Academic Test Results (later in training)	
		Strands						Total	# of retakes due to failure	discharge for failure
		I	II	III	IV	V	VI			
A	3.0	27.0	25.2	39.8	11.1	14.9	30.4	148.3	3	X
B	5.5	6.4	.6	7.7	1.1	2.3	7.4	25.2	1	
C	4.3	7.9	6.5	10.0	3.0	2.4	7.0	36.5	5	?
D	4.5	4.0	2.1	6.2	1.6	3.7	6.0	23.4	1	
E	3.4	13.8	3.6	15.4	5.3	5.7	13.2	56.9	4	?
F	4.9	4.9	1.9	11.1	1.3	1.3	5.2	25.2	0	
G	5.8	3.5	.6	8.0	3.2	1.0	8.4	24.5	0	
H	5.6	4.4	1.8	1.7	.5	2.2	4.6	15.0	0	
I	5.4	4.7	3.1	5.7	1.7	2.6	5.5	23.0	0	
J	3.4	19.2	1.4	13.2	2.5	4.1	9.5	49.7	0	
K	3.2	19.5	13.2	13.1	2.3	2.3	12.2	63.3	9	
L	5.6	7.0	4.3	7.2	2.3	2.3	7.8	32.8	4	
M	5.0	12.9	4.9	11.9	2.6	2.6	5.2	40.1	2	
N	5.0	16.7	3.7	6.5	2.9	2.6	5.7	37.3	0	
Mean	4.6	10.9	5.1	10.1	3.3	3.6	9.2	42.9		
Median	5.0	7.9	3.6	10.6	2.8	2.6	7.2	34.6		

Table 2. Recruits who failed no recruit academic tests (Prepilot)

Recruit	Age (in years)	Grades Completed	Days Attended	RGL (based on Gates-MacGinitie test and retest)
F	19	12	9	4.9
G	18	12	9.5	5.8
H	19	12	9	5.6
I	21	14	9.5	5.4
J	22	12	16.5	3.4
N	21	14.5	10	5.0

Table 3. Recruits who failed 2 or more academic tests (Prepilot)

Recruit	Age (in years)	Grades Completed	Days Attended	RGL (based on Gates-MacGinitie test and retest)	Number of Failures
A	20	12	27	3.0	3*
C	20	12	10.5	4.3	5
E	21	12	17	3.4	4
K	23	13.5	19.5	3.2	9
L	19	12	8.5	5.6	4
M	19	13	12	5.0	2

*Discharged after the third failure.

Table 4. Changes in Gates-MacGinitie Scores

Recruit	RGL (1st Test)	RGL (Retest)	Change in RGL
A	3.6	2.4	-1.2
B	5.8	5.2	- .6
C	4.1	4.5	+ .4
D	3.2	5.8	+2.6
E	2.5	4.2	+1.7
F	5.6	4.2	-1.4
G	5.8	5.8	——
H	5.6	5.6	——
I	5.8	5.2	- .6
J	2.4	4.4	+2.0
K	3.2	3.2	——
L	5.6	5.6	——
M	4.7	5.2	+ .5
N	5.8	4.2	-1.6